Space Weather Forecast

Issued on Friday, 14 October 2022 at 13:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Decreasing chance of Moderate class X-ray flares.
Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, with a long period Moderate-class flare observed from the larger region on the northwest limb, peaking at 14/0944 UTC. Two regions are now on the limb, meaning observation of their evolution is now extremely difficult, and their previous classification will be assumed until they rotate off. The remaining four regions are all relatively small and simple, either unchanged or in decay. There are also a number of filaments (lines of solar material held above the Sun's surface by its magnetic field) on the Earth-facing disc, one of which erupted yesterday. The subsequent Coronal Mass Ejection (CME) is expected to pass below Earth's orbit, although a glancing blow is possible.

Solar Wind / Geomagnetic Activity: The solar wind speed has shown signs of the onset of a minor coronal hole fast wind, likely combined with some weak CME influence. Wind speeds were at background levels throughout, although they increased from 300 km/s to around 380 km/s. The total Interplanetary Magnetic Field strength was weak at first but increased to moderate around 14/0300 UTC, jumping to strong at 14/0815 UTC. The north-south component was weakly southward directed at first, before starting to vary moderately after 14/0300 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to be mostly Low but perhaps Moderate, with a decreasing risk of Moderate flares mainly from the larger region which is currently rotating off the northwest limb. No significant regions are expected to rotate onto the visible disc.

Solar Wind / Geomagnetic Activity: Earth is currently experiencing a minor coronal hole fast wind, likely combined with weak CME effects from a CME launched on the 9th. A further CME launched early on the 13th may also give peripheral glancing effects, most likely on Day 4 (17 Oct). The current fast wind is likely to be fairly weak. Slightly elevated wind speeds are most likely but with the possibility of speeds reaching elevated levels. Wind speeds are expected to be at these levels into Day 2 (15 Oct), before easing into Day 3 (16 Oct). Geomagnetic activity is expected to be mostly Quiet to Unsettled, with a declining risk of Active intervals on Days 1 and 2 under combined fast wind and CME influence and again on Day 4 with the risk of further peripheral CME effects.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels, with just a very slight chance of rising in response to any large flares from the region on the northwest limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	25	15	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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